

with a superficial resemblance to the Arni buffalo of India, but larger in size and possessing horns exceeding those of the Arni in length, while in its skeleton it evinces a greater relationship to the Cape buffalo. Of course, the fossil remains only give us in their most perfect examples the more or less complete bony core of these horns. We owe to the art of primitive man a better idea of what this armature looked like as a living animal. In full-grown males the horns were marked with annular corrugations, not unlike those still to be seen on the horns of Asiatic buffaloes (there are traces of them also in some of the modern types of Central Africa). There was no considerable development of horn boss on the forehead, and the horns seem to have been flat rather than round. They were set on the skull in such a way that they were not so much directed backwards, as in the Indian buffaloes of to-day, but branched out from the head almost at right angles to the median line of the nose, and in very extravagant developments looked like the figure 3 laid on its side. In some of the drawings there is the indication of the buffalo having developed a considerable fringe of hair along the angle of the lower jaw, in some examples almost a throat mane.

When did this large buffalo become extinct? Some of the authorities I consulted thought not more than two or three thousand years ago. They stated that amongst the engraved rock surfaces that have been photographed there are drawings of this buffalo bearing a pack-saddle. In any case, the drawings I saw myself represented it as being hunted by some form of white man (presumably of Libyan race) wearing a skin garment round the loins and armed with a bow and arrow, or with a spear and javelin, these weapons being either Neolithic or actually within the age of metal.

So far as I know, there is no mention of this buffalo existing in North Africa to be found in any of the Roman writers.

In addition to the buffaloes in these prehistoric drawings, the African elephant is the most striking feature. He is unmistakably delineated with widespread ears, but seldom or never with very big tusks. The fore-foot of these elephants is sometimes girt about by what seems to be a circlet of converging spikes (unless this type of elephant developed bristles on his feet). This recalls in appearance the kind of antelope or buffalo snare which is still in use in Ethiopia and East Central Africa. Other beasts illustrated on the rock incisions of Africa north of the Sahara Desert are the lion, leopard, Mhor gazelle, Loder's gazelle, and domestic goats and sheep.

Among the remainder of the vanished fauna of Algeria which was apparently coeval with man, but is not to be identified in any prehistoric drawing, was a species of elephant closely allied to that of India, besides the *Elephas antiquus* of Pleistocene Europe. In addition to the buffalo, there was a large wild ox (*Bos opisthonomus*) allied to the aurochs of Europe, and a third form, *Bos ibericus*, apparently nearly related to the Indian zebu, and, if so, in all probability the parent of the modern domestic ox of negro Africa, as well as of types preserved for us in the art of ancient Egypt and of Crete. There was also an eland very like the elands of to-day, and what Prof. Pomel called a nilghai (*Boselaphus rayi*), with longer, more circular horns than those of the existing species; also a gnu, apparently related to the blue gnu of tropical Africa. There were two forms of hippopotamus, one the existing species, and the other a more primitive type with six incisors. Somewhat earlier, perhaps, in period of time was *Cervus pachygenys*, a remarkable form of deer with an exceedingly thick lower jaw, which developed on the outer aspect of its phalanges almost a boss of bone, the purpose or advantage of which does not seem to be very clear. Prof. Pomel also believed that he found in the recent deposits in Algeria a type of Palla antelope, besides an indigenous species of wild camel. As to the modern African elephant, it must have swarmed in Algeria down to the time of the Romans, say two thousand years ago. Its remains are discovered in nearly every watercourse in the northern littoral. The fossil remains on which the late Prof. Pomel's treatises were based can be seen (on application) at the museum of the University of Algiers.

H. H. JOHNSTON.

The Transference of Names in Zoology.

A LETTER on the above subject addressed to NATURE of January 26 by my friend, Dr. Calman, has appeared also in the American journal *Science*. This appeal to the Old World and the New evidently invites discussion. The letter apparently has in mind the man in the street and the natural history specialist, each of whom is to be protected from "moral and intellectual damage," which some applications of the law of priority might inflict upon him.

So far as the general public is concerned, two things should be borne in mind, first, that for popular books on natural history the publisher thinks one Latin name as bad as another, or a great deal worse, and, secondly, that the casual inquirer, when told the technical denomination of an animal, straightway forgetteth what has been told him, be it right or wrong, time-honoured or brand-new. Some handy little names might be kept in stock to gratify these incurious curious persons, as, for example, *Metoponaphrissontes*, probably applicable to quite a crowd of creatures from annelids to monkeys. Tears seem to mingle with the ink when Dr. Calman tells us that "at present, a writer who mentions Trichechus may be referring either to the walrus or the manatee." Yet what sort of a writer could have the ingenuity to leave it an open question which of the two animals he was discussing? "The great possibility of confusion" to which Dr. Calman refers appears to me to be simply a nightmare, by which he himself is one of the last men in the world to be terrified.

Incidentally, I would beg Dr. Calman and others not to be scared into using *Carcinides* (Rathbun, 1897) as the generic name of the common shore-crab, assigned to *Carcinus* by Leach in 1814. It is quite true that Latreille in 1796 named a genus *Carcinus* in the Amphipoda, but this ought to be considered a *nomen nudum*, since no species was designated as belonging to the genus, and in the course of 115 years no one has fitted the definition to any amphipod in particular.

The conclusion of Dr. Calman's letter reopens a controversy which I will now make one more effort to close.

No crustacean, perhaps, is better known than the common lobster. May I earnestly ask leave here to set forth in full the credentials of its proper scientific name?

1758. *Cancer gammarus*, Linn., *Systema Naturæ*, tenth edition, p. 631.

1758. *Astacus verus*, Borlase, *Natural History of Cornwall*, p. 274.

1777. *Astacus gammarus*, Pennant, *British Zoology*, vol. iv., p. 9.

1791. *Cancer (Astacus) gammarus*, Herbst, *Krabben und Krebse*, vol. ii., part i., p. 42.

1798. *Astacus marinus*, J. C. Fabricius, *Suppl. Entom. Systematicæ*, p. 406.

1813. *Astacus gammarus*, Leach, *Edinburgh Encycl.*, vol. vii., p. 398.

1815. *Astacus gammarus*, Leach, in *Trans. Linn. Soc.*, vol. ii., p. 344.

1819. *Astacus gammarus*, Leach, in *Samouelle's Entomologist's Comp.*, p. 95.

1831. *Astacus marinus*, Latreille, *Cours d'Entomologie*, p. 379.

1836. *Astacus gammarus*, Westwood, in *Partington's Brit. Cycl. Nat. Hist.*, vol. ii., p. 167.

1838. *Astacus gammarus*, Westwood, *The Entomologist's Text-book*, p. 101.

1844. *Astacus marinus*, O. G. Costa, *Atti R. Acc. Sci.*, vol. 5, part ii., p. 72.

1850. *Astacus gammarus*, White, *Catal. Brit. Crust.*, p. 35. With the imprimatur of John Edward Gray.

1857. *Astacus gammarus*, White, *Popular History of Brit. Crust.*, p. 101.

1875. *Astacus gammarus*, Sowerby, *Malac. Podoph. Brit.*, text to pl. 35.

1893. *Astacus gammarus*, Stebbing, *Hist. Crust.*, *Internat. Sci. Ser.*, vol. lxxiv., p. 203.

1897. *Astacus gammarus*, A. O. Walker, *Rep. Brit. Assoc.* (1906), p. 437.

1897. *Astacus gammarus*, Stebbing, *Ann. Nat. Hist.*, ser. 6, vol. xix., pp. 120, 355.

1900. *Astacus gammarus*, Stebbing, *South African Crust.*, part i., p. 34

1901. *Astacus gammarus*, T. Scott, Brit. Assoc. Hand-book Nat. Hist., Glasgow, p. 330.

1906. *Astacus gammarus*, T. Scott, Proc. Roy. Phys. Soc. Edin., vol. xvi., No. 4, p. 116.

1906. *Astacus gammarus*, Stebbing, Victoria Hist. Cornwall, Crustaceans, p. 269.

We have now to consider the significance of these references. There is general agreement at present that the marine lobster and the river crayfish must stand under separate generic names. The question is, Which of the two has a right to that name *Astacus*, which for many years they enjoyed in common? Miss M. J. Rathbun argues that this was determined in 1810 by Latreille, who in his "Consid. gén. sur les classes des Crustacés," &c., gives a "Table des genres avec l'indication de l'espèce qui leur sert de type," citing for *Astacus* only *Astacus fluviatilis*. How little Latreille intended by this choice of an illustrative species to strip the lobster of its ancestral title may be inferred from his remark in 1803 that the *astakos* of Aristotle is evidently the marine lobster, and from the fact that still in 1831 he retains lobster and crayfish together in the same genus. Suppose, however, that in such matters a man's intentions are of no consequence, and that only his actions count, the same rule will apply in the case of Borlase, who in 1758 mentions only one species of *Astacus*, and that the common lobster, thanks to the fact that the river crayfish was not, and seemingly still is not, found in the county of Cornwall. But really the man to whom the restriction of *Astacus* is due was not Borlase, nor yet Latreille, but William Elford Leach, who in 1815 detached from it Nephrops for the Norway lobster, and in 1819 Potamobius for the river crayfish.

There is talk about lists of *nomina conservanda*. Lists of *exempla vitanda* would be much more to the purpose. Here is a specimen. Leach having previously restricted *Astacus* to the lobster, Milne Edwards in 1837 unlawfully transfers that name to the crayfish already named Potamobius, and endows the lobster with the new name Homarus, of which it was in no need. In 1852 Dana (U.S. Expl. Exp., vol. xiii., p. 532) follows suit, although acknowledging that "Leach has undoubtedly priority," but for various fanciful reasons setting that claim aside. He informs us that "in some recent English works the name Potamobius has been substituted for *Astacus*, and *Astacus* for Homarus," just as if it were the English works that had committed the crime of substitution, and he winds up his argument by saying, "There seem, therefore, to be reasons enough for rejecting Leach's names, if it is of no weight that they remained for thirty years unrecognised by British authors." Yet John Obadiah Westwood was a British author.

Then Huxley in 1881 ("The Crayfish," third edition, p. 13) tells us that *Astacus* was retained for both lobster and crayfish until Milne Edwards (in 1837) called the lobster Homarus. "At the present time, therefore," he continues, "while the recognised technical name of the crayfish is *Astacus fluviatilis*, that of the lobster is *Homarus vulgaris*," though he admits that by *astakos* the Greeks, ancient and modern, mean the lobster and not the crayfish, and Huxley himself, while ignoring Leach's Potamobius, accepts and defines (pp. 252, 256) a family Potamobiidæ. In 1888 Spence Bate (*Challenger* Macrura, p. 192) follows in the wake of Dana, with some additional statements, of which my references will supply a sufficient refutation. Thus these distinguished men bolster up one another in wrong-doing, and feebly lament the supposed necessity of doing wrong. At a time when British natural history was at a very low ebb, and natural history at the British Museum had little to be proud of, Leach suddenly threw lustre alike on that institution and on the science of his country. Need we be surprised if John Edward Gray and Adam White and James Sowerby felt the honour of Leach bound up with that of the great museum to which they also belonged? They followed the lead of the famous Westwood in vindicating the claims of Leach. For English-speaking carcinologists on either side of the Atlantic now to aid and abet in the transference of Aristotle's *Astakos* and Leach's *Astacus* to a different genus will be unscholarly and unpatriotic, as well as a needless breach in the law of priority.

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Tunbridge Wells, February 24.
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Time Accuracy in Magnetic Registration.

SOME contributions by Dr. Bauer and Mr. Faris in the last volume of *Terrestrial Magnetism* have given rise to a number of letters in this journal concerning the starting times of magnetic disturbances and the accuracy in the determination of time on magnetograms. Mr. Walker (No. 2147, p. 236) points out that the accuracy is augmented by interrupting both curve and base line. This is evident; the beams of light reflected by the various mirrors of the variometers towards the horizontal cylindric lens have, in general, different inclinations, the spots of light on the paper have different heights, so that the interruptions in different traces do not lie on a line perpendicular to the base line. Dr. Krogness (No. 2145, p. 171) desires rapid registering with automatic time marks upon the curve itself, in order to solve the question of simultaneity or non-simultaneity of the abrupt beginnings of magnetic storms for different parts of the globe.

For a number of years, an arrangement answering Dr. Krogness's wishes has been applied at the Meteorological Institute at De Bilt (Netherlands); the method was described for the first time in the *Annuary B.* for 1905, and recently in *Terrestrial Magnetism* (vol. xv., p. 31, 1910) in a communication concerning the magnetic storm of September 25, 1909. By means of a contact clock, the circuit of a battery is closed for two seconds every minute; the current illuminates a little glow lamp, the filament of which is straight and placed vertically. This filament takes the place of the illuminated slit in the usual arrangement of an *Adie* magnetograph; its image, about $\frac{1}{2}$ mm. wide, would be formed in the plane of the paper. Just in front of the paper, however, a screen with narrow, horizontal slit is mounted; accordingly, only the light admitted through the slit falls on the paper, and we get a little line or spot about $\frac{1}{2}$ mm. long and $\frac{1}{4}$ mm. wide. Every minute such a spot is formed; an hour corresponding to 15 mm. of base line, the recorded curve consists of a series of points with a mutual distance of $\frac{1}{4}$ mm. Another contact lights the glow lamp every twenty minutes for four seconds; this contact falls between two minute-contacts, and is convenient in reading the time. The correction and the rate of the contact clock, and consequently the times of the contacts, are exactly known; the moments of the twenty-minute contacts are 0m., 20m., and 40m. Greenwich mean time.

On quiet or moderately disturbed days the trace looks at first sight as a continuous curve; at times of larger disturbances the points are further apart. With the usual arrangement, in strongly disturbed parts the trace becomes very faint, or is sometimes altogether lost; this drawback may be avoided by taking a wide slit, but then many details in quiet or less disturbed parts of the curve are lost. The new method of registration enables the variations to be followed exactly from minute to minute in all circumstances; it must be granted, however, that some details, e.g. rapid oscillations of small period, are not exactly reproduced by this method.

The contacts being given once every minute, the beginning of a disturbance, which, as a rule, falls between two contacts, is known with an accuracy of $\frac{1}{2}$ minute; the uncertainty may be reduced, however, to $\frac{1}{4}$, $\frac{1}{8}$, or $1/2^n$ minute by giving the contacts 2, 3, or n times a minute; there is no objection against doing so, only the velocity of registration should be taken greater 2, 3, or n times respectively.

It is evident that the method described shows some analogy with that for seismic registration; here too a time mark is given generally once a minute by a contact clock. These clocks being kept for sale, among others, by the manufacturers of seismographs, the arrangement of magnetic registration in the manner applied at De Bilt is a rather easy matter. For the solution of various problems recently advanced—simultaneity or non-simultaneity of the abrupt beginnings of magnetic storms for different elements, direction and velocity of propagation, and character of disturbances, &c.—the providing of a number of stations, spread over the globe in an appropriate manner, with registering apparatus of the kind described, would undoubtedly yield important data and results.

G. VAN DIJK.

Meteorological Institute, De Bilt, February 21.